

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 11071-4 (1984): Inset type aerodrome lighting fittings,
Part 4: Touchdown zone lighting fittings [ETD 24:
Illumination Engineering and Luminaries]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



Indian Standard

SPECIFICATION FOR
INSET TYPE AERODROME LIGHTING FITTINGS

PART 4 TOUCH DOWN ZONE LIGHTING FITTINGS

UDC 628.971.8 : 656.71 : 625.717.3



© Copyright 1985

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

**SPECIFICATION FOR
INSET TYPE AERODROME LIGHTING FITTINGS
PART 4 TOUCH DOWN ZONE LIGHTING FITTINGS**

Illuminating Engineering and Luminaires Sectional Committee,
ETDC 45

Chairman

SHRI G. K. KHEMANI

Representing

Central Public Works Department, New Delhi

*Members*SURVEYOR OF WORKS (ELECTRICAL)-III (*Alternate to*

Shri G. K. Khemani)

SHRI G. K. AITHAL

Bajaj Electricals Ltd, Bombay

SHRI JAGDISH SHARAN (*Alternate*)

SHRI P. K. BANDYOPADHYAY

Peico Electronics & Electricals Ltd, Bombay

SHRI P. K. SANYAL (*Alternate*)

SHRI G. BHATTACHARYA

National Test House, Calcutta

SHRI P. C. PRADHAN (*Alternate*)

SHRI N. S. CHARI

Crompton Greaves Ltd, Bombay

SHRI V. R. MAJUMDAR (*Alternate*)

SHRI N. S. CHARI

Association of Indian Engineering Industry, New
DelhiSHRI A. MUKHERJEE (*Alternate*)

SHRI H. N. GUPTA

Directorate General Factory Advice Services and
Labour Institutes (Ministry of Labour),
BombaySHRI V. S. SASIKUMAR (*Alternate*)

JOINT DIRECTOR STANDARDS

Railway Board, Ministry of Railways

(ELECT) TLM, RDSO

DEPUTY DIRECTOR STANDARDS,

TLM (*Alternate*)

SHRI R. V. NARYANAN

Directorate General of Supplies & Disposals, New
DelhiSHRI ANIL GUPTA (*Alternate*)

SHRI V. H. NAVKAL

The Bombay Electric Supply & Transport
Undertaking, BombaySHRI S. H. MILLAR (*Alternate*)(*Continued on page 2*)

© Copyright 1985

INDIAN STANDARDS INSTITUTION

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(Continued from page 1)

Members

SHRI U. S. NIGAM

SHRI M. R. PAUL (*Alternate*)

SHRI S. B. NIYOGI

SHRI J. K. GHOSH (*Alternate*)

SHRI J. R. PARI

SHRI S. K. NEOGI (*Alternate*)

LT-COL B. B. RAJPAL

SHRI R. S. KANWAR (*Alternate*)

SHRI K. S. SARMA

SHRI K. P. SHANBHOGUE

SHRI H. SINHA

SHRI K. K. ROHATGI (*Alternate*)

SHRI V. K. SOOD

SHRI SURESH DHINGRA (*Alternate*)

SHRI P. N. SRINIVASAN

SHRI G. S. SRIVASTAVA

SHRI H. S. SAINI (*Alternate*)

SHRI G. N. THADANI

SHRI S. K. GHOSH (*Alternate*)

SHRI S. P. SACHDEV,

Director (Elec tech)

Representing

Central Mining Research Station (CSIR),
Dhanbad

Directorate of Technical Development and
Production (Air), Ministry of Defence

The General Electric Co of India Ltd, Calcutta

Engineer-in-Chief's Branch, Army Headquarters

National Physical Laboratory (CSIR), New Delhi

National Industrial Development Corporation
Ltd, New Delhi

Illuminating Engineering Society of India,
Calcutta

The Mysore Lamp Works Ltd, Bangalore

PNS Lighting Design & Consultancy, Bangalore

Metallurgical Engineering & Consultants, Ranchi

Engineers India Ltd, New Delhi

Director General, ISI (*Ex-officio Member*)

Secretary

SHRI SURH BIR SINGH

Deputy Director (Elec tech), ISI

Panel for Aviation Lighting Fittings, ETDC 45/P 3

Convener

SHRI G. K. KHEMANI

Central Public Works Department, New Delhi

Members

GP-CAPT H. S. BHATIA

Directorate of Technical Development and
Production (Air), Ministry of Defence

SHRI S. B. NIYOGI (*Alternate*)

SHRI S. N. DAMLE

Sanjeev Engineering Works, Bombay

SHRI P. A. DAVE

AMA Private Ltd, Bombay

SHRI P. R. KIBE

Paista Fund Glass Works, Dabhade

SHRI V. PADMANABHAN

Indian Ordnance Factory, Dehra Dun

SHRI S. ASTHANA (*Alternate*)

SHRI R. C. REKHI

International Airports Authority of India, New
Delhi

SHRI T. N. C. SRINIVASAN (*Alternate*)

SHRI K. K. ROHATGI

Pradip Lamp Works, Patna

SHRI P. K. SANYAL

Peico Electronics and Electricals Ltd, Bombay

SHRI K. S. SARMA

National Physical Laboratory (CSIR), New
Delhi

SHRI S. VENKASWAMY

Civil Aviation Department, New Delhi

Indian Standard

SPECIFICATION FOR INSET TYPE AERODROME LIGHTING FITTINGS PART 4 TOUCH DOWN ZONE LIGHTING FITTINGS

0. FOREWORD

0.1 This Indian Standard (Part 4) was adopted by the Indian Standards Institution on 5 October 1984, after the draft finalized by the Illuminating Engineering and Luminaires Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard is intended to deal with the specific requirements of inset touch down zone light fittings. The standard has been developed with a view to ensure good design, high quality workmanship and test procedures so that the fittings provides reliable services in actual field application under low visibility conditions.

0.3 This standard is one among the series being developed for inset type of lighting installations to be provided at airports in this country. This series consists of the following parts:

Part 1 General requirements and tests

Part 2 Runway centre line lighting fittings

Part 3 Approach lighting fittings

Part 4 Touch down zone lighting fittings

0.4 This standard shall be read in conjunction with Part 1 of this standard.

0.5 In the preparation of this standard assistance has been taken from the following:

International standards and recommended practices — Aerodromes Annex 14 (1976). Ed 7. International Civil Aviation Organization.

Aerodrome design manual: Part 4 Visual aids. Ed 1. 1976. International Civil Aviation Organization.

Advisory circular No. 150/5345-46 (1975) Specification for semiflush airport lights. Department of Transportation, Federal Aviation Administration, USA.

IS : 11071 (Part 4) - 1984

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS: 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part 4) specifies the photometric performance and the essential mechanical and electrical requirements (excluding lamps) of inset type touch down zone lighting fittings to be installed in runway pavements.

2. TERMINOLOGY

2.1 For the purpose of this standard definitions given in Part 1 of this standard shall apply.

3. CONDITIONS OF USE

3.1 The provisions of 3 of Part 1 of this standard shall apply.

4. GENERAL CONSTRUCTION

4.1 The provisions of 4 of Part 1 of this standard shall apply.

4.2 The runway touch down zone lighting fittings shall be of uni-directional type and shall emit a light beam in the direction of approach. The assembled lighting fitting shall not project above the surrounding pavements by more than 13'00 mm.

5. OPERATING TEMPERATURE

5.1 The provisions of 5 of Part 1 of this standard shall apply.

6. OPTICAL COMPONENTS

6.1 The provisions of 6 of Part 1 of this standard shall apply.

7. ALIGNMENT DEVICE

7.1 The provisions of 7 of Part 1 of this standard shall apply.

8. WATER TIGHTNESS OF THE UNIT

8.1 The provisions of 8 of Part 1 of this standard shall apply.

*Rules for rounding off numerical values (revised).

9. ELECTRIC COMPONENTS

9.1 The provisions of **9** of Part 1 of this standard shall apply.

10. MARKING

10.1 The provisions of **10** of Part 1 of this standard shall apply.

11. TESTS

11.1 Classification of Tests

11.1.1 *Type Tests* — The following shall constitute the type tests:

- a) Visual examination (*see 11.2*),
- b) Photometric test (*see 11.3*),
- c) Insulation resistance test (*see 11.4*),
- d) Vibration test (*see 11.5*),
- e) Cycling and temperature shock test (*see 11.6*),
- f) Low temperature test (*see 11.7*),
- g) Accelerated life test (*see 11.8*),
- h) Static load test (*see 11.9*),
- j) Leakage test (*see 11.10*),
- k) Impact test (*see 11.11*),
- m) Horizontal static load test (*see 11.12*),
- n) Hydraulic impact test (*see 11.13*),
- p) Protective plating test (*see 11.14*),
- q) Lamp by-pass test (*see 11.15*),
- r) Surface temperature test (*see 11.16*),
- s) Humidity test (*see 11.17*),
- t) Salt spray test (*see 11.18*),
- u) Rain test (*see 11.19*), and
- v) Dust test (*see 11.20*).

11.1.2 Acceptance Test — The following shall constitute the acceptance tests:

- a) Visual examination (*see* 11.2),
- b) Photometric test (*see* 11.3),
- c) Insulation resistance test (*see* 11.4),
- d) Vibration test (*see* 11.5),
- e) Cycling and thermal shock test (*see* 11.6),
- f) Static load test (*see* 11.9),
- g) Leakage test (*see* 11.10),
- h) Impact test (*see* 11.11), and
- j) Horizontal static load test (*see* 11.12).

11.1.3 Routine Test — The following shall constitute the routine tests:

- a) Visual examination (*see* 11.2),
- b) Photometric test (*see* 11.3),
- c) Insulation resistance test (*see* 11.4), and
- d) Leakage test (*see* 11.10).

11.2 Visual Examination — The provisions of 11.2 of Part 1 of this standard shall apply.

11.3 Photometric Tests

11.3.1 The provisions of 11.3 of Part 1 of this standard shall apply.

11.3.2 Vertical and horizontal intensities shall be determined at one degree intervals and shall not be less than the values indicated in the Appendix A.

11.3.3 For the purpose of routine photometric test the intensity shall be reversed at the following points:

- a) at horizontal angles of $\pm 5^\circ$ from centre axis in a plane with an elevation angle of 6° , and
- b) at 12° vertical and 0° horizontal. The values obtained shall correspond to those specified in Appendix A.

11.4 Insulation Resistance Test — The provisions of 11.4 of Part 1 of this standard shall apply.

11.5 Vibration Test — The provisions of 11.5 of Part 1 of this standard shall apply.

11.6 Cycling and Thermal Shock Test — The provisions of 11.6 of Part 1 of this standard shall apply.

11.7 Low Temperature Test — The provisions of 11.7 of Part 1 of this standard shall apply.

11.8 Accelerated Life Test — The provisions of 11.8 of Part 1 of this standard shall apply.

11.9 Static Load Test — The provisions of 11.9 of Part 1 of this standard shall apply.

11.10 Leakage Test — The provisions of 11.10 of Part 1 of this standard shall apply.

11.11 Impact Test — The provisions of 11.11 of Part 1 of this standard shall apply.

11.12 Horizontal Static Load Test — The provisions of 11.12 of Part 1 of this standard shall apply.

11.13 Hydraulic Impact Test — The provisions of 11.13 of Part 1 of this standard shall apply.

11.14 Protective Plating Test — The provisions of 11.14 of Part 1 of this standard shall apply.

11.15 Lamp By-pass Test — The provisions of 11.15 of Part 1 of this standard shall apply.

11.16 Surface Temperature — The provisions of 11.16 of Part 1 of this standard shall apply.

11.17 Humidity Test — The provisions of 11.17 of Part 1 of this standard shall apply.

11.18 Salt Spray Test — The provisions of 11.18 of Part 1 of this standard shall apply.

11.19 Rain Test — The provisions of 11.19 of Part 1 of this standard shall apply.

11.20 Dust Test — The provisions of 11.20 of Part 1 of this standard shall apply.

APPENDIX A

(Clauses 11.3.2 and 11.3.3)

PHOTOMETRIC REQUIREMENTS OF TOUCHDOWN ZONE LIGHTING FITTING

LIGHT	COLOUR	MINIMUM BEAM COVERAGE						MINIMUM AVERAGE INTENSITY IN SPECIFIED COLOURS cd x 10 ³ (see Note 3)	LIMITS OF AVERAGE INTENSITY RATIO (see Note 4)	ANGULAR SETTINGS (see Note 5)	
		Main Beam (see Note 1)		(see Note 2)						Elevation (degrees)	Toe-in (degrees)
				10%		5%					
		H	V	H	V	H	V				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Touchdown zone	White	10	7	14	12	17	17	5	0.5-1	5.5	4

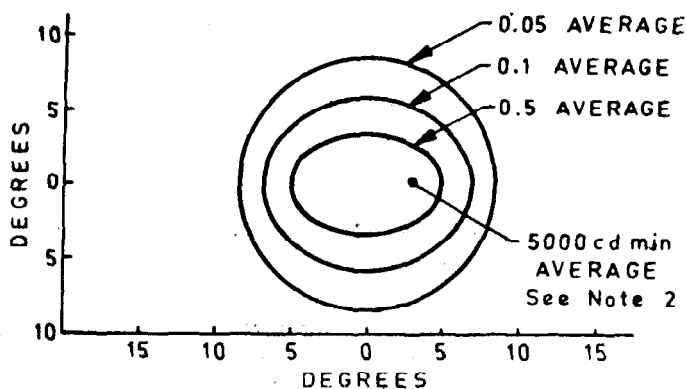
NOTE 1 — Throughout this region the intensity of a new unused light at maximum current/voltage should be not less than half the average intensity and should not exceed the average intensity by more than 50 percent.

NOTE 2 — At 10 percent and 5 percent of average intensity.

NOTE 3 — Within beam coverages specified in col 3 and 4.

NOTE 4 — The average intensity over the angles specified in col 3 and 4 of a typical new light as compared to the average intensity of a runway edge light.

NOTE 5 — Setting are based upon beam coverages given in col 3 and 4. If lights have greater beam coverages, settings should be adjusted appropriately. The normal beam axis is located midway between the 50 percent intensity points of the horizontal and vertical intensity curves. When two figures are indicated for angular settings the higher value refers to lights farther from the threshold.



See Appendix A

NOTE 1 — Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

a	5	7	8.5
b	3.5	6	8.5

NOTE 2 — Maximum should not exceed 1.5 times actual average.

FIG. 1 TOUCHDOWN ZONE LIGHTING FITTINGS

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress,	pascal	Pa	1 Pa = 1 N/m ²